CLAIMS

1. A method for preparing and screening one or more compounds, said compound(s) being handled in a bulk of a stationary phase, the method comprises the sequential steps of (a) synthesis of the compound(s) by a chemical reaction performed in the bulk of a stationary phase, (b) separating the compound(s) in the same bulk of a stationary phase and (c) screening of the separated compound(s) in or on the bulk of stationary phase.

2. A method according to claim 1, comprising additional analysis of the separated compound(s) in the bulk of the stationary phase or an isolated sample of the compound(s).

3. A method according to claim 1, wherein the chemical reaction involves a reaction mixture including chemical reagents.

4. A method according to claim 3, wherein introduction of chemical reagents onto the bulk of the stationary phase provides the reaction mixture which gives rise to the compound(s).

5. A method according to claim 3, wherein the compound(s) are synthesised in the bulk of the stationary phase by introducing chemical reagents involved in the chemical reaction onto the bulk of the stationary phase thereby generating a reaction mixture.

6. A method according to claim 3, wherein each of the chemical reagents is individually introduced onto the bulk of the stationary phase.

7. A method according to claim 3, wherein each of the chemical reagents is introduced onto the bulk of the stationary phase in a solution.

8. A method according to claim 7, wherein the solution comprises one or more solvents.

9. A method according to claim 3, wherein the reaction mixture is localised to a well-defined area in the bulk of the stationary phase.

10. A method according to claim 3, wherein chemical reagents involved in a specific synthesis of one or more compounds are introduced to a well-defined area on the bulk of the stationary phase.

11. A method according to claim 1, wherein various syntheses of one or more compounds are performed in parallel on separate and well-defined areas of the same bulk of stationary phase.

12. A method according to claim 11, wherein synthesis of more compounds on the same bulk of a stationary phase provides a library of different compounds.

13. A method according to claim 1, wherein the chemical reaction is assisted by microwave radiation.

14. A method according to claim 13, wherein the chemical reaction is exposed to microwave radiation by placing the bulk of the stationary phase comprising the reaction mixture in a microwave cavity.

15. A method according to claim 1, wherein the stationary phase comprises silica gel, aluminium oxide, cellulose, graphite, molecular sieve and polymers.

16. A method according to claim 15, wherein the stationary phase is silica gel.

17. A method according to claim 15, wherein the stationary phase is aluminium oxide.

18. A method according to claim 15, wherein the stationary phase is polyacrylamide.

19. A method according to claim 1, wherein the bulk of stationary phase is dispersed onto or between an inert backing(s).

20. A method according to claim 19, wherein the inert backing comprises glass, plastic, fibrous materials, paper, metals or mixtures thereof such as aluminium coated paper.

21. A method according to claim 19, wherein the layer thickness of the bulk of the stationary phase when dispersed onto or between the inert backing(s) is 10 μm to 5 mm, preferably 10 μm to 2 mm, more preferably 100 μm to 250 μm.

22. A method according to claim 19, wherein the combined bulk of stationary phase and inert backing is a silica gel thin-layer chromatography plate with an plastics backing.

23. A method according to claim 19, wherein the combined bulk of stationary phase and inert backing is a silica gel thin-layer chromatography plate with a glass backing.

24. A method according to claim 1, wherein the separation is performed by allowing at least some of the components of the reaction mixture to migrate in the bulk of the stationary phase.

25. A method according to claim 24, wherein the compound(s) are allowed to migrate in the bulk of the stationary phase by application of chromatographic means.

26. A method according to claim 24, wherein the separation of the compounds is performed in the presence of a liquid phase.

27. A method according to claim 26, wherein the liquid phase is a solvent or mixtures of solvents and optionally one or more auxiliary agents.

28. A method according to claim 27, wherein the liquid phase comprises ethyl acetate/hexane, methanol/dichloromethane/ammonia, methanol/acetonitrile/ammonium phosphate and n-butanol/pyridine/water/glacial acetic acid.

29. A method according to claim 24, wherein the compounds are separated in the presence of an electric field.

30. A method according to claim 29, wherein the compounds are separated by electrophoresis.

31. A method according to claim 1, wherein the compounds are screened by means of biological, chemical or biochemical methods.

32. A method according to claim 31, wherein the biological, chemical and biochemical methods are selected from bioautographic techniques, overlay techniques, immunostaining, autoradiographic techniques, enzymatic analysis, derivatisation, receptor-binding assays, reporter gene assays, cell proliferation assays, physiologic assays, transient transfection or melanophor pigment-translocation.

33. A method according to claim 31, wherein the compounds are screened by means of analytical methods such as detection of catalytic activity by changes in absorption of light or by detection of fluorescence due to a cleaved substrate.

34. A method according to claim 1 for the synthesis, separation and screening of combinatorial libraries of compounds.

35. A method according to claim 34, wherein the compounds of the combinatorial libraries are synthesised by multi-component reactions.

36. A method according to claim 34, wherein the combinatorial libraries comprise compounds such as arylpiperazines, sulfonamides, amino acids, amides, alcohols, amino alcohols, aldehydes and amino aldehydes.

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